



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,012	05/15/2000	SIMON J. FENNEY	R&GCASE305	3729

7590 11/20/2003

FLYNN THIEL BOUTELL & TANIS
2026 RAMBLING ROAD
KALAMAZOO, MI 49008-1699

EXAMINER

CAO, HUEDUNG X

ART UNIT	PAPER NUMBER
----------	--------------

2671

13

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/486,012

Applicant(s)

FENNEY, SIMON J.

Examiner

Huedung X Cao

Art Unit

2671

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-39 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasawa (US 6,061,065) in view of Cabral et al. (US 5,949,424).

As per claim 20, and a similar claim 29, Nagasawa teaches a method for shading a three dimensional textured computer graphic image comprising the steps of:

providing data defining the three dimensional computer graphic image, the image comprising a set of pixels (Nagasawa, col. 2, lines 26-29);

providing data defining at least one light source and its direction illuminating the image wherein the light source is defined in the same local coordinate system (Nagasawa, col. 4, lines 25-44);

providing a set of surface normal vectors corresponding to the texture data for the image wherein the surface normal vectors are stored in a local coordinate system (Nagasawa, col. 6, lines 28-30). Nagasawa does not teach "for each pixel in the image, deriving a shading value to be applied to that pixel from the surface normal vector

Art Unit: 2671

assigned to the pixel and the light source data and an individual surface normal vector from the set of surface normal vectors is assigned to each pixel. Cabral teaches that providing an individual surface normal vector from the set of surfaces normal vectors is assigned to each pixel is widely used in the art (Canral, column 4, lines 6-10; column 6, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of teaching of Carnal, to configure Nagasawa's method as claimed because processing data in a more detail level such as pixels instead of polygon, such interpolating an individual surface normal vector assigned to each pixel helps increase the sophistication, flat shading in advanced graphic feature.

As per claim 21, and a similar claim 30, in which the surface normal vectors are stored in polar coordinates (Nagasawa, col. 1, line 66-col. 2, line 7)).

As per claim 22, and a similar claim 31, in which the light source data is stored in polar coordinates (Nagasawa, col. 6, line 20-col. 7, line 24).

As per claim 23, in which the step of deriving a shading value to be applied to a pixel comprises deriving a color value and a blending value the surface normal vector assigned to the pixel and from the light source data and combining this color value with existing color data from that pixel in dependence on the blending value (Nagasawa, col. 6, lines 20-27).

As per claim 24, and a similar claim 32, in which the surface normal vectors are stored in Cartesian coordinates (Nagasawa, col. 7, lines 10-24).

As per claim 25, and a similar claim 33, in which the light source data are stored in Cartesian coordinates (Nagasawa, col. 6, lines 5-27).

Art Unit: 2671

As per claim 26, and a similar claim 34, in which for each surface normal vector only two of the Cartesian coordinates are stored (Nagasawa, col. 7, lines 10-24).

As per claim 27, and a similar claim 35, applying a linear filter to the texture data at least once to map values to individual pixels (Cabral, column 4, lines 44-46, column 6, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of teaching of Carnal, to configure Nagasawa's method as claimed because to apply a linear filter to the texture in order to improve the effect of texture mapping onto objects.

As per claim 28, applying a glossiness parameter to a pixel which would have been because Cabral's color/texture information and illumination model could be utilized to apply a glossiness to the pixels helps to improve the effect of texture mapping onto objects.

As per claim 36, in which the step of deriving a shading value to be applied to a pixel comprises deriving a color value and a blending value the surface normal vector assigned to the pixel and from the light source data and combining this color value with existing color data from that pixel in dependence on the blending value (Nagasawa, col. 6, lines 20-27; and Cabral, column 13, line 7).

As per claim 37, Nagasawa teaches a method for shading a three dimensional textured computer graphic image comprising the steps of:

providing data defining the three dimensional computer graphic image, the image comprising a set of pixels (Nagasawa, col. 2, lines 26-29);

providing data defining at least one light source and its direction illuminating the image wherein the light source is defined in the same local coordinate system (Nagasawa, col. 4, lines 25-44);

providing a set of surface normal vectors corresponding to the texture data for the image wherein the surface normal vectors are stored in a local coordinate system (Nagasawa, col. 6, lines 28-30).

It is noted that Nagasawa does not teach “determining whether or not the basic computer image is subjected to supplemental shading” as claimed. However, it would be obvious to implement the Nagasawa invention to include that determining step because given a display object to the computer graphic system as in Nagasawa, the initial step for the system would inherently be the step of deciding what to do (e.g., processing, rendering, shading, ...) with that object data; or more specifically, with a graphical shading system such as Nagasawa or Cabral, the question of whether that object is subjected to supplemental shading is clearly be used.

Nagasawa does not teach “for each pixel in the image, deriving a shading value to be applied to that pixel from the surface normal vector assigned to the pixel and the light source data and an individual surface normal vector from the set of surface normal vectors is assigned to each pixel. Cabral teaches that providing an individual surface normal vector from the set of surfaces normal vectors is assigned to each pixel is widely used in the art (Canral, column 4, lines 6-10; column 6, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of teaching of Carnal, to configure Nagasawa's method as claimed because

Art Unit: 2671

processing data in a more detail level such as pixels instead of polygon, such interpolating an individual surface normal vector assigned to each pixel helps increase the sophistication, flat shading in advanced graphic feature.

Claim 38 adds into claim 37 "bump maps" which Cabral teaches in the bump mapping (column 4, lines 18-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of teaching of Carnal, to configure Nagasawa's method as claimed because shading object using the bump map helps increase the sophistication, flat shading in advanced graphic feature.

Claim 39 adds into claim 37 the coordinates systems such as polar and Cartesian coordinate systems which Nagasawa teaches in column 7, lines 19-24 and Cabral teaches in column 7, lines 64-65.

Art Unit: 2671

Inquires

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Huedung Cao** whose telephone number is **(703) 308-5024**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231


or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-0377.

Huedung Cao
Patent Examiner


MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600